

Test # 2

me: Student id: Section#: Serial#: *****

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DEPARTMENT OF COMPUTER SCIENCE SUMMER SEMESTER 05
ITCS241: Assembly Language Programming First Test Date: JULY 25, 2005

QUESTION ONE: Write a complete assembly program that: [6 pts]

- Defines an array YAS consisting of 12 words and initializes them with any HEX signed values.
- Displays all elements of array YAS as words in HEX.
- Copies all words of array YAS to another array FAS in reverse order. (Define array FAS).
- Displays on the next line all words of array FAS as DECIMAL integers. Use space to separate values.

Title Question 1

Include Irvine32.inc

• stack 64
• data
Yas words 1h, 2h, 3h, 4h, 5h, 6h, 7h, 8h, 9h, Ah, Bh, Ch
Fas words 12 dup(?)
print byte 10

• Code

main proc far

mov si, offset Yas

mov cx, 12

L1: mov eax, 0 ; display Yas

mov ax, [esi]

call writehex

inc si

inc si

loop L1

call crlf

mov si, offset Yas + 22

mov di, offset Fas

mov cx, 12

2: mov eax, 0 ; copy

mov ax, [esi]

mov [di], ax

call writedec ; display

inc di

inc di

call writestring, space

loop L2

exit

main endp

end

mov eax, 0

mov esi, offset Yas

mov cx, lengthof Yas

L2: mov ax, [esi]

call writehex

inc esi

dec cx

loop L2

mov si, offset Yas + 22

mov di, offset Fas

mov cx, 12

L1: mov ax, [esi]

mov [di], ax

inc esi

dec cx

loop L1

mov di, offset fas

mov cx, 12

mov ax, [di]

mov [di], ax

inc di

dec cx

loop L1

QUESTION TWO: Choose the BEST correct answer for each of the following questions (1 ...11) and write its symbol down in the table shown below {11 x 1 = 11 points}

- 1) The .STACK 1024 directive defines:
 - a) A stack of 1024 KByte
 - ☒ b) A stack of 1024 Byte
 - c) A stack of 1024 MByte
 - d) A stack of 1024 bits
 - e) None
- 2) The type of the SOURCE operand used in the instruction: MOV BX, @data is:
 - a) Immediate
 - b) Direct
 - c) Indexed
 - ☒ d) indirect
 - e) None
- 3) The instruction that stores 0 in the memory word pointed by eax register is:
 - a) MOV EAX, 0
 - ☒ b) MOV [EAX], 0
 - c) SUB [EAX], [EAX]
 - d) SUB EAX, EAX
 - e) None
- 4) The register used to store the loop repetition value when using LOOP instruction is:
 - a) ESI
 - b) EBX
 - ☒ c) ECX
 - d) IP
 - e) None
- 5) The program that accepts .obj files as input and produces .exe files as output is:
 - ☒ a) LINK
 - b) MASM
 - c) DEBUG
 - d) Textpad
 - e) None
- 6) The type of the DESTINATION operand used in the instruction: SUB byte ptr [BX], AL is:
 - a) Immediate
 - b) Direct
 - c) Indexed
 - ☒ d) indirect
 - e) None
- 7) The instruction that subtracts the contents of CX register from the word pointed by ebx register is:
 - a) SUB CX, [EBX]
 - b) SUB ebx, CX
 - ☒ c) SUB [ebx], CX
 - d) SUB WORD PTR EBX, CX
 - e) None
- 8) The directive that defines an array OUR consisting of 1000 words all initialized with 0 is:
 - ☒ a) OUR word 1000 dup(0)
 - b) OUR word 1000H dup('0')
 - c) OUR word 1000H dup('0')
 - d) OUR word 1000 dup('0000')
 - e) None
- 9) If the physical address is 7CF0F and the segment value is 78CF, then the offset is:
 - a) 75640
 - b) 78CF0
 - c) 805BF
 - ☒ d) 421F
 - e) None
- 10) The 8-bit value 10001000 represents unsigned decimal value _____ and signed decimal value _____.
 - a) 136, 120
 - ☒ b) 136, -120
 - c) 136, -136
 - ☒ d) -120, 136
 - e) None
- 11) The instruction that swaps the contents of 2 dwords U1 and U2 stored in memory locations is:
 - a) XCHG U1 U2
 - b) XCHG [U1], U2
 - c) XCHG [U1], [U2]
 - ☒ d) XCHG U2, U1
 - e) None

Question #	1	2	3	4	5	6	7	8	9	10	11
Answer	B	B	B	C	a	d	C	a	d	B	<input checked="" type="radio"/> e

$$\begin{aligned}
 786F0 + K &= 7CF0F \\
 786F0 + K &= 7CF0F \\
 K &= 7CF0F - 786F0 \\
 \begin{array}{r}
 7CF0F \\
 87310+ \\
 \hline
 421F
 \end{array}
 \end{aligned}$$

$10001000 \rightarrow 136$
 $128 + 8 = 136$
 $76543210 \rightarrow -120$

QUESTION THREE: Choose the BEST correct answer for each of the following questions (1 ...4) and write its symbol down in the table shown below [4 x 1 = 4 pts]
 • Carefully study the following data definitions and instructions then answer the next 5 questions.

RT BYTE 24H, 3CH, 7FH, 9AH
 PF WORD 5B5AH, 66CCH, 88DFH, 0FFH, 11BAH
 UT DWORD 8E596D7AH, 56FFBBH, 99BBAACCH, 20807030H

MOV BX, WORD PTR RT
 MOV AX, WORD PTR UT
 MOV DH, BYTE PTR UT-2
 MOV CH, TYPE UT
 MOV CL, LENGTHOF PF

After executing the above instructions,

- The number of bytes occupied by all the above data definitions is :
 a) 30H b) 30 c) 48H d) 48 e) None
- The register AX will contain:
 a) 8E59H b) 598EH c) 7A6DH d) 6D7AH e) None
- The register DH will contain:
 a) 11H b) BAH c) FFH d) 56H e) None
- The register CX will contain:
 a) 020CH b) 0C02H c) 0405H d) 0C04H e) None

Handwritten notes and memory dump:

AX = 6D7A
 CH = 4
 0A, 04
 040AH
 CX = CH CL
 [04 05]

UT	PF	RT
7A	5A	24
6D	5B	3C
59	CC	7F
8E	66	9A
BB	DF	
FF	88	
56	FF	
00	CC	
CC	DI = BAH	
AA	11	
BB		
99		
30		
70		
80		
20		

2F AFH

$$\begin{aligned} Bx &= x^2 3 \\ Cx &= 5 \\ Ax &= 0 \\ AL &= 44 \end{aligned}$$

T9	B0	1
	44	7
	00	2
	3A	2
	FC	4
	2C	1
	AF	1
	2F	1
	2C	1
	0F	9

1) Register AX will contain

a) 00E8 b) 0287

Register EX will contain:

a) 0000 b) FFFF

Parity
odd

carry
yes

even
odd

d) Unknown

c) PE, NC

(d) PE, CY

c) None

$BX = \sqrt{1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2 + 7^2}$
 $CX = \sqrt{1^2 + 4^2 + 9^2 + 16^2 + 25^2 + 36^2 + 49^2}$
 $AX = 0$

$$\begin{aligned} & \cancel{2x} = 7 \\ & Cx = 54 \quad 27 \quad 0 \\ & Ax = 0 \\ & \cancel{AL} = \cancel{44} \\ & \cancel{Ex} = 3 \\ & \cancel{AL} = \cancel{7E} \\ & \cancel{Bx} = 5 \\ & AL = AA \\ & Bx = 7 \\ & AL = D9 \\ & Bx = 9 \\ & AL = E8 \\ & Cx = FF \quad FF \end{aligned}$$

$$\begin{array}{r}
 44 \\
 3 \overline{) 44} \quad A + \\
 \hline
 7E \\
 2C + \\
 \hline
 1A \quad A \\
 \hline
 2F + \\
 \hline
 1D \quad A \\
 \hline
 0F
 \end{array}$$

~~Small~~

$\frac{0}{\cancel{\text{O}}} \quad 44A + 8A + 4 =$

~~3A~~
~~7E~~

1
D9
OF

E8

3A
44

TE 000° -

0000 0000 0000 0000

||||| ||||| ||||| |||||

+
1 12
2C¹⁴
7E

AA
DE

D9

Page _____

$$AX = 00E8$$